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Elaphomyces leucosporus and *E. mutabilis*, new for Turkey

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Abstract—*Elaphomyces leucosporus* and *E. mutabilis* have been determined as new records for the Turkish mycobiota, based on collections from Rize and Trabzon provinces. Brief descriptions and photographs related to their macro- and micromorphologies are provided.

Key words—biodiversity, *Elaphomycetaceae,* hypogeous ascomycetes, truffle-like fungi

Introduction

Of the 73 confirmed taxa of *Elaphomyces* T. Nees listed by IndexFungorum (2021), eight—*E. anthracinus* Vittad., *E. citrinus* Vittad., *E. cyanosporus* Tul. & C. Tul., *E. decipiens* Vittad., *E. granulatus* Fr., *E. leucocarpus* Vittad., *E. muricatus* Fr., and *E. septatus* Vittad.—have been recorded from Turkey (Uzun & Kaya 2021).

During routine field studies in Rize and Trabzon provinces of Turkey, some hypogeous macromycete samples were collected and identified as *Elaphomyces leucosporus* and *E. mutabilis*. After checking the current Turkish fungal checklist (Sesli & al. 2020) and subsequent contributions (Uzun & Kaya 2019, 2020, 2021, Uzun 2021), we found they represented new records for Turkey. This paper aims to contribute to the mycobiota of Turkey by adding new records.

Materials & methods

Ascocarps were collected from Rize and Trabzon provinces during 2017–2018. field studies. The fruitbodies were photographed in their natural habitats where necessary morphological and ecological observations were noted. After the specimens were transferred to the laboratory and dried in an air-conditioned room, the dried material was examined microscopically using a Nikon Eclipse Ci-S trinocular light microscope; SEM images were obtained by a Hitachi SU5000 scanning electron microscope. The specimens were identified with the help of Vittadini (1831), Dodge (1929), Hawker (1954), Zhang (1991), Montecchi & Sarasini (2000), Arroyo & al. (2005), Castellano & al. (2018), and Paz & al. (2012, 2017). The specimens are preserved in the fungarium of Department of Biology, Science Faculty, Karamanoğlu Mehmetbey University, Karaman, Turkey (KMU).

Taxonomy

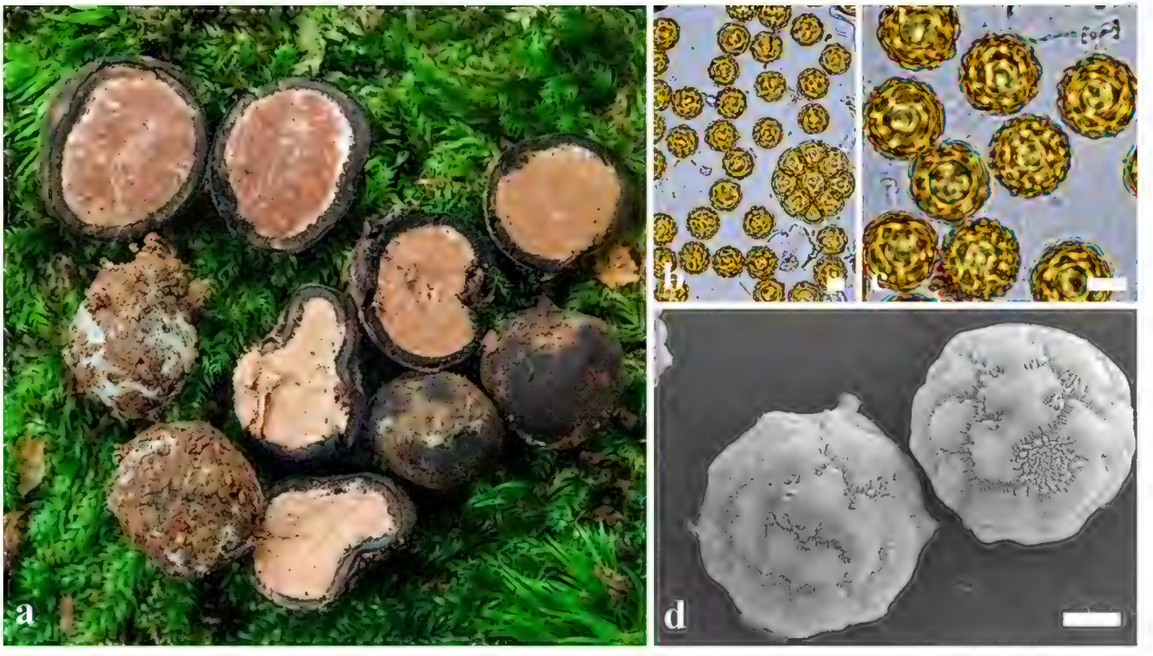

Fig. 1. *Elaphomyces leucosporus* (KMU-Uzun 6729).
a. ascocarps; b, c. ascospores (LM); d. ascospores (SEM).
Scale bars: b, c = 10 µm; d = 5 µm.

Elaphomyces leucosporus Vittad. Monogr. Tuberac.: 71 (1831) Fig. 1

Ascoma 5–10 mm diam., globose to spherical, some with an evanescent crust or a basal groove. Peridium thick, greyish brown to dark-brown or blackish, peridial surface dark brown to blackish, smooth, some slightly papillate. Gleba powdery, light milky-brown to dark coffee-brown. Asci spherical, 8-spored, rarely 4-spored. Ascospores 18–22 µm, spherical, pale yellow to yellowish-brown, covered with thick rods of irregular height that form a rough and wavy perisporium.

Specimen examined—**TURKEY, Trabzon, Esenyurt village**, 40.88°N 39.67°E, 745 m, in soil with greenish mycelium around *Fagus orientalis* and *Rhododendron ponticum* in broadleaved forest of *Castanea sativa, F. orientalis R. ponticum* and *Corylus* sp., 30.08.2018, Y.Uzun 6729 (KMU).

Comments—*Elaphomyces leucosporus* is regarded as an uncommon or a rare species (Hawker 1954). It is similar to *E. spirosporus* A. Paz & Lavoise in terms of fruit body morphology, spore size and attachment to a greenish mycelium, but the spores of *E. spirosporus* are covered with very short rods aligned longitudinally and forming spirals, while *E. leucosporus* produces spores with thick rods of irregular height that form a rough and wavy perisporium (Paz & al. 2012). Paz & al. (2017) commented on the marked preference of *E. leucosporus* for producing ascocarps in spring, but the Turkish collection was made during summer.

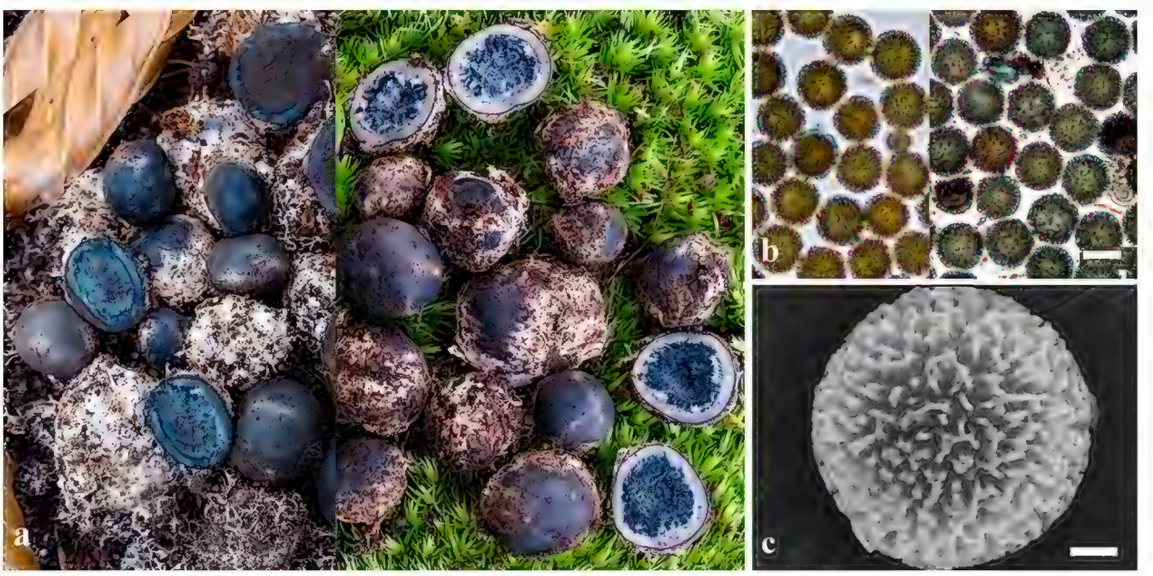

Fig. 2. *Elaphomyces mutabilis* (KMU-Uzun 6724).
a. ascocarps; b. ascospores (LM); c. ascospores (SEM).
Scale bars: b = 10 µm; c = 2 µm.

Elaphomyces mutabilis Vittad. Monogr. Tuberac.: 65 (1831) Fig. 2

Ascoma 8–20 mm diam., globose to subglobose, some depressed, generally encrusted with a white or white-ochraceous mycelial layer, rarely with uncovered partial surface areas; the surface beneath the mycelial layer smooth to minutely verrucose, dull, dark grey blackish to black. Odor weak, slightly fruity. Peridium 0.8–1.2 mm thick, whitish grey to bluish grey, with a thin blackish cortex. Gleba comprising a greyish blue powdery spore mass and whitish grey to grey bluish black hyphae. Asci globose. Ascospores

10–14 µm diam., globose to spherical, olive-green, blackish brown to black, ornamented with an irregular labyrinth formed by the anastomosing of fine spinelike or rodlike structures.

Specimens examined—**TURKEY, Rize, Ardeşen,** Ortaalan village, 41.17°N 41.10°E, 460 m, in soil under *Castanea sativa,* 11.08.2017, Y.Uzun 5748 (KMU); **Trabzon, Vakfıkebir,** Şenocak village, 40.95°N 39.28°E, 430 m, in soil under *C. sativa, Fagus orientalis* and *Rhododendron ponticum*, 20.02.2018, Y.Uzun 6193 (KMU); **Sürmene,** Yokuşbaşı village, 40.87°N 40.10°E, 340 m, in soil under *C. sativa, F. orientalis* and *R. ponticum*, 29.08.2018, Y.Uzun 6724 (KMU).

Comments—In general, the morphological characters of our Turkish materials agree with those given in literature (Zhang 1991, Montecchi & Sarasini 2000, Arroyo & al. 2005). *Elaphomyces mutabilis* can be confused with *E. striatosporus* Kers during collection due to the dense crust formed by white mycelium, but *E. striatosporus* is distinguished by larger spores (14–17 µm) with 2–3 µm tall branched, long, and parallel aligned ridges (Paz & al. 2012). Note: Our report of *E. mutabilis* is cited in Solak & Türkoğlu (2022), published two months ago while this paper was in processing.)

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